CSC123 Programming Project 2

Inheritance and Polymorphism

Publishing

Design a class hierarchy consisting of Publication, Magazine, Book, and KidsMagazine classes as follows:

1. A Publication has a publisher, number of pages, a price, and a title. The class should implement a print method that displays all of this information.
2. A Magazine is a kind of publication that has a publication unit (monthly, weekly, biweekly). Magazine should override the print method of Publication and display all the new information.
3. A Book is a kind of publication that has an author. Book should also override the print method of Publication.
4. A KidsMagazine is a kind of magazine that has a recommended age range. Again, KidsMagazine should override the print method of Publication.
5. The class Publication implements the interface Comparable by alphabetically comparing titles so that a collection of Publication objects can be sorted by title.
6. The class Publication overrides the toString() method inherited from the Object class to return the publisher and the title. It also overrides an equality that is based on the title of a Publication, so that two Publication objects with the same title are equal.
7. The Book class overrides the toString() method further to return the publisher, the title, and the author.

Implement a test class that stores 20 different types of publications: general, magazine, book, or kids' magazine in an array of Publication. Your test class should have the following methods (not limited to) to exploit polymorphism and print the information, sorted by title, about each object stored in the array:

1. A sort method that sorts the array of publications.
2. A binary search method that searches the array of publications.
3. A print method that prints the information of all publications in the array.
4. A constructor that creates the array of 20 publications with different types.
5. A main method that provides a text-based menu with three menu items:
    a. search -- to search the array of publications with user entered publication title
    b. print – to print the information of all publications in the array
    c. exit – exit the program

Requirements

1. Design all classes and draw the class inheritance hierarchy.
2. Implement all classes.
3. Test the complete implementation.

Submission

The completed project should be included in a single file and submitted onto the blackboard. The hardcopy or email submission will not be accepted. Your submission should include:

1. The class diagram (inheritance hierarchy).
2. The Java code for all classes.
3. Your test: including test data, test cases, and test results